**Name: Satwik Hagwane**

**Project batch: Stress Detection with Machine Learning and Python.**

**Literature survey:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Sr no. | Title of the paper | Name of the author | Published year | remarks |
| 1. | Stress Detection with Machine Learning and Deep Learning using Multimodal Physiological Data | Pramod Bobade Department of Computer Science and Engineering National Institute of Technology, Karnataka Surathkal, India [pramodbobade2@gmail.com](mailto:pramodbobade2@gmail.com)  Vani M. Department of Computer Science and Engineering National Institute of Technology, Karnataka Surathkal, India [vani.nitk@gmail.com](mailto:vani.nitk@gmail.com) | Published in year :2020 | * Dataset used: WESAD dataset. * Algorithms: K-Nearest Neighbour, Linear Discriminant Analysis, Random Forest, Decision Tree, AdaBoost and Kernel Support Vector Machine. Besides, simple feed forward deep learning artificial neural network is introduced for these three-class and binary classifications. * Methodology:   dataset and features extraction :  WESAD is the dataset that is used for this study.it is multimodal dataset & is the collection of motion data and physiological features of 15 subjects from both a chest-worn device RespiBAN Professional and a wrist-worn device Empatica E4. |
| 2. | A Decision Tree Optimised SVM Model for Stress Detection using Biosignals | 1. Alana Paul Cruz, 2. Aravind Pradeep, 3. Kavali Riya Sivasankar 4. Krishnaveni K.S | Published at:July 28 - 30, 2020, | * In this work ECG as the bio signal and extracted its features. * The advantage of taking ECG as the bio signal is, information about respiratory signals - EDR (ECG Derived Respiration) feature can be easily derived without any extra sensors. * training and validation of our new model we used Physionet’s “drivedb” database * the model uses Optimised Support Vector Machines (SVM) using decision trees. * Methodology:   1. Performance Measures The evaluation metric used in this study is Accuracy which is calculated using the help of Confusion Matrix.   2. Proposed System :Initially, the model was trained using Cubic SVM with Gaussian Kernel. For a better model, here we have used Tree Optimised SVM which is a combination of Decision Tree and SVM algorithms. * Results in reference to better accuracy: Our model with Tree optimised Cubic SVM shows more accuracy in identifying stress when compared to already existing models |
| 3. | Automatic Stress Detection Using Wearable Sensors and Machine Learning: A Review | Shruti Gedam Dept. of Computer Science & Engg. Birla Institute of Technology, Mesra Ranchi, India shrutgedam@gmail.com  Sanchita Paul Dept. of Computer Science & Engg. Birla Institute of Technology, Mesra Ranchi, India sanchita07@gmail.com | Published on: July 1-3, 2020 | * paper aims to provide a comprehensive review on various stress detection techniques and gives a reliable guideline towards more efficient detection of stress. * features extracted using Heart rate, Heart rate variability and skin conductance are more useful in prediction of stress level of an individual. * Support vector machine, Random forest and K-Nearest Neighbor are the most effective classification algorithms. * Advantages: physiological signals can be used to detect stress of an individual with the help of wearable sensors and machine learning algorithms are effective and affordable. * Limitations: many researchers used multiple features correlated with each other which results in increased computation time. Also some of them used costly commercial devices for physiological signal collection where low-cost sensors can be used. |
| 4. | Machine Learning and IoT for Prediction and Detection of Stress | Mr.Purnendu Shekhar Pandey BML, Munjal University, Gurgaon Haryana, India purnendu.pandey@bml.edu.in | 2017 | * Internet of Things (IoT) : used to communicate the patience about his/her acute stress condition. * Machine Learning (ML): used to predict the condition of the patient * Components used: * Node MCU :used as the development board and micro-python for programing language * pulse sensor: to detect the pulses from which we calculated the heartbeat rate. * Server and Program Flow * Algorithms used :   A. Logistic Regression  B. Support vector machine(SVM)   * Methodologies: * The developed prototype detects whether a person is in stress using variability in his/her heart rate. * It can also help in detecting pattern of changes in a person’s heart rate when he/she is working out at the gym. * Each device is individual specific and needs to be calibrated for it to function properly. * During calibration the person should be in a relaxed mood and should be resting. * This is done to set up a baseline , after calibration, the device uses this baseline to determine whether that person is in stress/nervous, over trained or currently training . * The heartbeat readings are pushed to the server where they are filtered using a user’s network id to keep track of readings for a particular individual. |